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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: MASTRANGELO, Giuseppe)
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Application No.: 09/731,500)
)
Filing Date: 12/07/00)
)
For: INSTALLATION OF DIGITAL DATA RECEIVERS)
)
)
Art Unit: UNKNOWN)



TRANSMITTAL OF PRIORITY DOCUMENT

Director of the United States Patent and Trademark Office
Washington, D.C. 20231

Dear Sir:

Enclosed herewith is a certified copy of British Patent Application No. 9929013.2
for which the above-identified patent application claims priority from.


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Respectfully Submitted

HEAD, JOHNSON & KACHIGIAN

Date: 3-7-01

Customer No. 24,118


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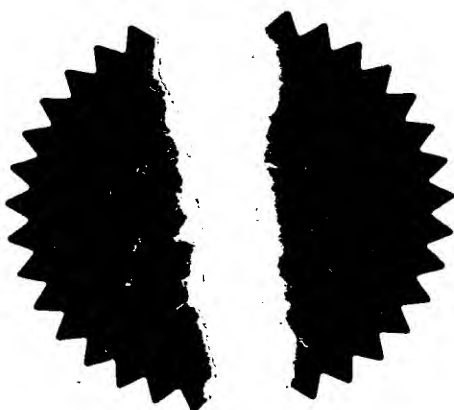
The Patent Office
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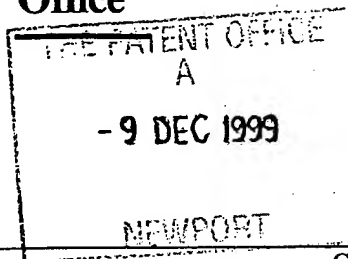
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Dated

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Patent
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1/77



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P01/7700 0.00-9929013.2

Request for grant of a patent

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The Patent Office

Cardiff Road
Newport

Gwent NP9 1RH

1. Your reference

GW-G29182

09 DEC 1999

2. Patent application number

(The Patent Office will fill in this part)

9929013.2

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Pace Micro Technology Plc

Victoria Road
Saltaire
Shipley
BD18 3LF

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

England

7548569001

4. Title of the invention

Installation of Digital Data Receivers

5. Name of your agent (if you have one)

Bailey Walsh & Co.

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

5, York Place
Leeds
LS1 2SD

Patents ADP number (if you know it)

224001

6. If you are declaring priority from one or more earlier patent applications, give the and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
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7. If this application is divided or otherwise derived from an earlier UK application, the earlier application

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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer "Yes" if:

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- a) any applicant named in part 3 is not an inventor, or
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Description

Claim(s)

Abstract

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6

2

10. If you are also filing any of the following, state how many of each item.

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Statement of inventorship and right to grant of a patent (Patents Form 7/77)

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11. I/We request the grant of a patent on the basis of this application

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Date

B. Wood

08. 12. 99

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G Wood
0113 2433824

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Installation of Digital Data Receivers

The invention which is the subject of this application is to provide apparatus and a method of installation of digital data receivers which are used to receive data which is broadcast from a remote location and process the data to generate video, audio and/or auxiliary data, and for the implementation and installation of the receivers at the premises where the invention is to be used.

Conventionally, digital data is broadcast from one or a number of remote locations and is transmitted either via a satellite system, cable network system or terrestrial systems and can be received at a number of premises which are provided with the appropriate data receiving equipment. When the data is received, it is passed to a receiver apparatus which is typically provided with processing means which allow the decoding of the data, processing of the data and the generation of video, audio and/or auxiliary data therefrom.

At the present time, when a customer orders a receiver, and/or wishes to subscribe to service providers, the receiver and data receiving apparatus is required to be installed at the premises of the customer by an installation operator.

As part of the installation procedure, the operator is required to measure the power levels of the incoming signals on which the data is carried to ensure that the levels are within designated parameters and that the installation is correct for the customer before leaving. In order to be able to do this, relatively expensive and complex equipment is required to be used. If the measurements received are not within certain parameters, then the operator may be required to fit attenuators and/or other components to bring the operation of the receiver within the required parameters and this can be time

consuming for the operator as it requires the operator to perform a hardware fitting operation at the location of the receiver.

The aim of the present invention is to provide apparatus and a method for installing a receiver which allows for the reduction in time required for the installation and, furthermore, allows for the installation to be accurate and relatively easily performed by the operator.

In a first aspect of the invention there is provided a method of installation of a receiver to receive digital data which is broadcast to the location of the receiver, said method comprising, measuring the power level of incoming frequency signals at two predetermined spaced points on the signal band by measuring the content of the AGC (automatic Gain Control) converters within the receiver, providing an amplitude correction filter which can be selectively operated at the RF input to allow the correction of amplitude variations with frequency, the selective operation of the filter dependent upon the power level measurements.

Typically, the method will allow for the receiver, during the installation procedure, to take into account the power level measurements automatically and make the required corrections as part of the automatic installation procedure. This overcomes the need for the installation operator to use expensive equipment and take time to measure the signals manually.

Typically, in the method, if the high end signal level is greater than the low end signal level, then no linearization is required. However, if the relative power difference is greater than a predetermined level, such as, for example, 10dB then the linearization circuit can be utilised to adjust the power level so that the incoming signal is within a known power range. In this

manner, the method utilises the ability to use the relative signal strength rather than absolute signal strength to install the receiver and therefore avoids the need for the operator to undertake the initial measurements during the installation procedure.

In a further aspect of the invention there is provided receiver apparatus for receiving broadcast digital data which is transmitted and received by the apparatus and passed to the receiver via an RF input, said receiver including a linearization circuit which can be selectively activated by the receiver control system upon comparison of measurements of the power levels at two predetermined points on the incoming signal and, if the comparison reveals a difference which is greater than a predetermined level the linearization circuit is activated to adjust the receiver settings during the installation procedure.

In a yet further aspect of the invention there is provided a method of installation of a receiver to receive digital data which is broadcast to the location of the receiver, said method comprising, measuring the power level of incoming frequency signals at two predetermined spaced points on the signal band, providing means for the comparison of the measurements and if the comparison shows a value within a predetermined parameter an indication is provided to the installer and if the comparison shows a value outwith the predetermined parameter a control system in the receiver adjusts the operation of one or a combination of components within the receiver until the value is within the predetermined parameter.

Typically the extent and level of adjustment is made with reference to at least one algorithm in the control system.

In one embodiment the components which are adjusted are any, or any combination of capacitors, inductors, resistors.

Thus, the present invention provides at the installation of the receiver, for measurements to be taken to indicate whether the receiver is working correctly, but rather that the conventional approach in which the installer is required to perform hardware adjustments to bring the measured values within the acceptable operating parameters, the receiver in accordance with the invention is provided with the processing and control capacity to undertake the comparison of the measured values and compare with predetermined parameters. If the values are acceptable, an indication is provided to the installer but if not the control system for the receiver undertakes adjustments of the operation of one or a plurality of components in the receiver until the values are acceptable. This means that the installer does not have to perform the hardware adjustments and does not have to carry relative complex equipment to perform the installation. The indication of when the receiver is within the predetermined parameters and/or when adjustments are being made can be displayed as on screen messages. Although receivers which are provided to receive data via cable broadcast systems are particularly susceptible, it should be appreciated that the invention can be utilised in any system where it may of potential benefit to the installation procedure.

Specific embodiments of the invention will now be described with reference to the accompanying diagrams, wherein:-

Figure 1 illustrates a linearization circuit in accordance with one embodiment of the invention; and

Figure 2 illustrates the manner in which adjustments can be made if required.

The apparatus and method as herein described is of particular relevance to receivers which are provided to receive digital data via

a cable network where the digital data is transmitted by a broadcaster and to the customer via a cable network system. When a customer subscribes to the service they need to have a receiver and this is typically installed by an operator acting on behalf of the cable network provider. As part of the installation procedure, and as part of the current invention, the installation apparatus and circuitry within the receiver is set to measure the power level of the incoming signal at two predetermined positions, typically at the bottom and top of the band. This measurement is undertaken by measuring the content of the AGC converters. Typically, most receivers require two tuners and at present each has an AGC circuit and for large dynamic range inputs, a switch filter is required. However, by implementing the invention as herein described, only one AGC switch filter is required and, furthermore, the AGC circuit can be simplified. At present most single conversion tuners use switched in filters to overcome problems such as intermodulation problems however these filters are reflective in that they attenuate a signal by reflecting the signal back but this provides a problem in that it degrades the return loss.

As part of the invention a switched equaliser is provided which attenuates the unwanted signals and this has the advantage that the return loss is never degraded.

When the measurements are taken it is found that most cable receivers have problems when changing to high frequencies because of these losses. Figure 1 shows a simple circuit which is suitable for most cable receivers in that if the measurements taken at the bottom and top of the band indicate that the high end signal level is greater than the low end signal level, then no linearization, 2 is required. If however a relative power difference is greater than a predetermined level such as 10dB then a switch in linearization circuit 4 is used to equalise either the XdB or YdB as required so

that the incoming signal is then within predetermined parameters. Thus, a relative signal strength is used rather than the absolute signal strength to set up the receiver and this displays to the installer if there is a network problem. Furthermore, the receiver can, if there is a problem, utilise circuitry provided in the receiver to take into account the problem. Figure 2 illustrates how by changing the values of the inductors 6, capacitors 8 and/or resistors 10, varying equalisation slopes can be obtained and the difference between the high end signal and low end signal brought to within the required parameter which therefore means that the receiver is installed to operate within the required parameters.

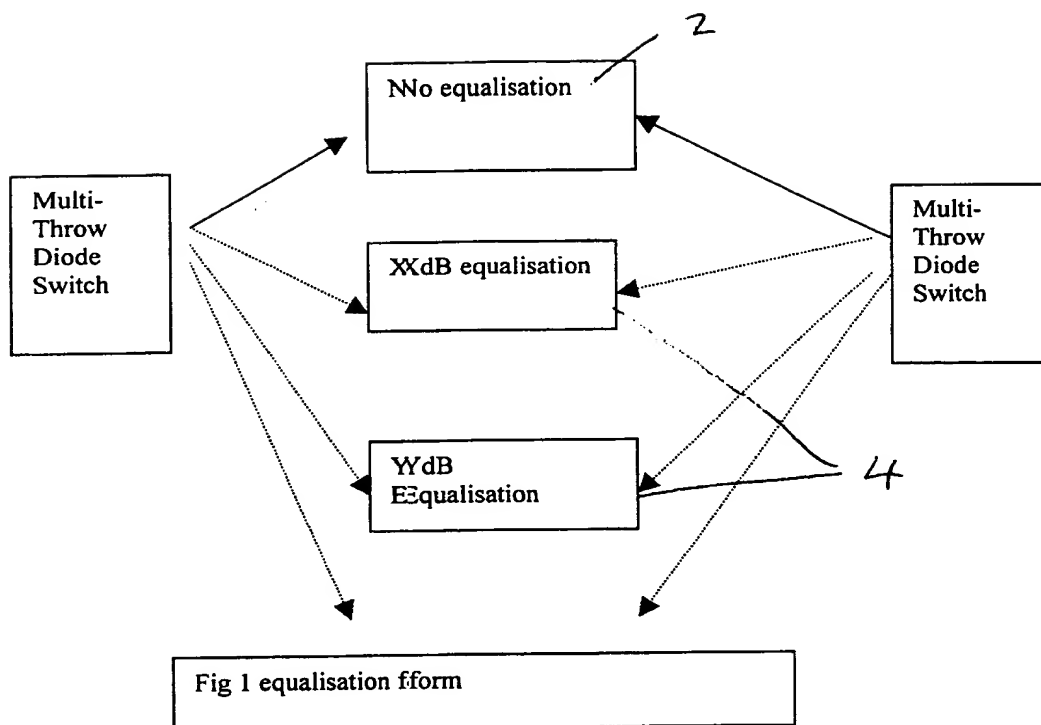


Figure 1

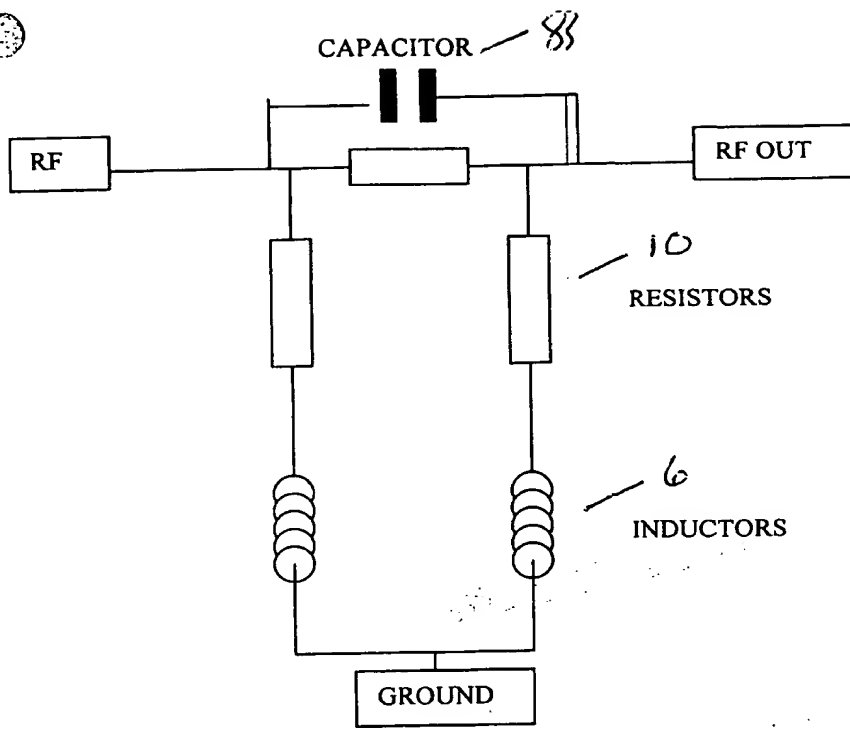


Figure 2